CLAIMS:

What is claimed is:

1. An apparatus comprising:

a transmitter, to generate a multiband ultra-wideband (MB-UWB) signal for transmission via one or more antenna(e), wherein the generated MB-UWB signal is composed of a number (N) of narrower band pulses in a number of different frequency bands, wherein the number (M) of sequential or parallel pulses within a given narrower band is greater than one (1) pulse.

2. An apparatus according to claim 1, the transmitter comprising:

a front end, to encode received content for transmission through select ones of the narrower band pulses of the generated multiband ultra-wideband signal.

3. An apparatus according to claim 2, the transmitter front end comprising:

one or more encoder(s), to receive the content and incorporate error correction information therein.

4. An apparatus according to claim 3, wherein the one or more encoder(s) performs one or more of Reed-Solomon encoding, punctured convolutional encoding, concatenated convolutional encoding in combination with Reed-Solomon encoding, turbo coding and/or low density parity check (LDPC) coding on the received content to enable the detection and correction of burst errors within a received signal at a remote receiver.

5. An apparatus according to claim 2, the transmitter front end comprising:

one or more mapper(s), responsive to the encoder(s), to perform M-ary Binary Orthogonal Keying (MBOK) on the encoded content.

6. An apparatus according to claim 5, the transmitter front end further comprising:

one or more interleaver(s), responsive to the binary-orthogonal mapper(s), to interleave the encoded content across a number (N) of blocks of content.

8. An apparatus according to claim 7, the transmitter front end further comprising:

a combiner element(s), responsive to the interleaver(s), to receive interleaved content and apply a pseudo-random noise (PN) mask thereto.

9. An apparatus according to claim 8, the transmitter front end further comprising:

a summing element(s), responsive to the combiner, to receive masked content and apply a preamble thereto, wherein the preamble facilitates timing synchronization and channel estimation in a receiver of the multiband ultra-wideband (MB-UWB) signals.

10. An apparatus according to claim 9, the transmitter further comprising:

an radio frequency (RF) backend, responsive to the transmitter front end, to receive the encoded content from the front end, modulate the received content and prepare it for transmission across a number (N) of pulses within relatively narrow bands of an ultra-wideband (UWB) spectrum.

11. An apparatus according to claim 10, the RF backend comprising:

a multiband modulator(s), responsive to the transmitter front end, to receive the encoded content and modulate the received content using quadrature phase shift-keying (QPSK).

12. An apparatus according to claim 10, wherein the multiband modulator(s) modulate the received content using binary phase shift-keying (BPSK).

13. An apparatus according to claim 2, the transmitter front end further comprising:

one or more interleaver(s), responsive to the encoder(s), to interleave the encoded content across a number (N) of blocks of content.

14. An apparatus according to claim 2, the transmitter front end further comprising:

a combiner element(s), responsive to the encoder(s), to receive encoded content and apply a pseudo-random noise (PN) mask thereto.

15. An apparatus according to claim 2, the transmitter front end further comprising:

a summing element(s), responsive to the encoder(s), to receive encoded content and apply a preamble thereto, wherein the preamble facilitates timing synchronization and channel estimation in a receiver of the multiband ultra-wideband (MB-UWB) signals.

16. An apparatus according to claim 15, wherein the preamble is generated through a number of instances of a CAZAC-16 sequence for at least a subset of the narrower bands of the ultra-wideband signal.

17. An apparatus according to claim 1, the transmitter comprising:

an radio frequency (RF) backend, responsive to the transmitter front end, to receive the encoded content from the front end, modulate the received content and prepare it for transmission across a number (N) of pulses within relatively narrow bands of an ultra-wideband (UWB) spectrum.

18. An apparatus according to claim 17, the RF backend comprising:

a multiband modulator(s), responsive to the transmitter front end, to receive the encoded content and modulate the received content using quadrature phase shift-keying (QPSK).

20. An apparatus according to claim 1, further comprising:

a receiver, coupled with one or more antenna(e), to receive and demodulate each of a number (N) of pulses spread across multiple narrower bands of an ultra-wideband spectrum to recover content embedded therein.

21. An apparatus according to claim 1, further comprising:

one or more antenna(e), through which the apparatus can transmit and/or receive multiband ultra-wideband signal(s).

22. An apparatus according to claim 21, wherein the apparatus employs frequency division duplex (FDD) to enable simultaneous transmission and reception on separate frequencies using a common antenna(e).

23. An apparatus according to claim 1, wherein the transmitter is the apparatus.

24. An apparatus according to claim 1, where the number (N) of narrower bands is between two (2) and twenty (20), while the number of sequential or parallel pulses is between two (2) and one hundred.

25. An apparatus according to claim 24, wherein the number of narrower bands of the ultra-wideband spectrum is fifteen (15) or less, each band 500 megahertz (MHz) wide, supporting 500+ megabits per second (500+Mb/s).

26. An apparatus according to claim 24, wherein the number of sequential pulses within at least a subset of the narrower bands is four (4) or less.

26. An apparatus comprising:

a receiver, responsive to one or more antenna(e), to receive an ultra-wideband (UWB) signal comprised of a number (N) of pulses within narrower bands of an UWB spectrum, wherein the number (M) of pulses within each of the narrower bands is one or more and is dynamically controlled by the receiver and/or transmitter.

27. An apparatus according to claim 26, the receiver comprising:

a channel acquisition element, responsive to the one or more antenna(e), to detect energy within any of the narrower bands of the UWB spectrum, perform timing acquisition/synchronization and channel estimation.

28. An apparatus according to claim 27, the channel acquisition element comprising:

a timing acquisition element, responsive to the one or more antenna(e), to perform one or more of coarse timing acquisition and/or fine timing acquisition based, at least in part, on detection of preamble information within a select band of the number of narrower bands within the UWB spectrum.

29. An apparatus according to claim 26, the receiver comprising:

a radio frequency (RF) front end, to receive signals within one or more of the number (N) of multiple narrower bands of the ultra-wideband (UWB) spectrum, and to demodulate the received signal(s).

30. An apparatus according to claim 29, wherein the demodulation performed by the RF front end is complementary to the modulation performed by a remote transmitter of the received MB-UWB signals.

31. An apparatus according to claim 29, the RF front end to perform quadrature phase shift-keying (QPSK) demodulation of the received signals.

32. An apparatus according to claim 26, the receiver comprising:

a digital backend, to correct at least a subset of errors encountered during transmission and to decode content embedded within a demodulated representation of the received MB-UWB signals to produce a representation of content transmitted to the receiver from a remote transmitter.

33. An apparatus according to claim 32, the digital backend comprising one or more of a feed forward equalizer, a pseudo-noise mask generator, a combiner, a block de-interleaver, a detector, a feedback equalizer, and/or a decoder, coupled to identify and correct at least a subset of errors encountered during transmission of the MB-UWB signals, and to distinguish encoded content embedded within the received signals intended for the receiver from those intended for other receiver(s).

34. An apparatus according to claim 26, further comprising:

one or more antenna(e), coupled to the receiver, through which the receiver receives MB-UWB signals.

35. An apparatus according to claim 34, wherein the apparatus employs frequency division duplexing (FDD) to simultaneously transmit and receive MB-UWB signals via one or more antenna(e).

36. An apparatus according to claim 26, further comprising:

a transmitter, to generate a multiband ultra-wideband (MB-UWB) signal for transmission via one or more antenna(e), wherein the generated MB-UWB signal is composed of a number (N) of narrower band pulses in a number of different frequency bands, wherein the number (M) of sequential pulses within a given narrower band is greater than one (1) pulse.

37. An apparatus according to claim 26, wherein the apparatus is the receiver.

38. A method comprising:

encoding content for transmission via a multiband ultra-wideband (MB_UWB) signal through application of a time-frequency code extension, wherein the time-frequency code extension defines the number (M) of sequential pulses within any of the number (N) of narrower bands comprising a multiband ultra-wideband (MB-UWB) signal.

39. A method according to claim 38, the encoding further comprising:

incorporating one or more error correction codes, multiple access codes, and/or preambles into the content prior to said transmission.

40. A method according to claim 39, wherein the error correction codes include one or more of a Reed-Solomon encoding, punctured convolutional coding, concatenated convolutional coding in combination with Reed-Solomon encoding, turbo coding, and/or low density parity check (LDPC) coding.

41. A method according to claim 38, the encoding further comprising:

applying M-ary binary orthogonal keying (MBOK) codes to the content; and

interleaving said MBOK encoded content.

42. A storage medium comprising content which, when executed by an accessing machine, causes the machine to implement a method according to claim 38.

43. A communication device comprising:

memory having content available therein; and

a control logic, coupled with the memory, to selectively access and execute at least a subset of the content available within the memory to implement a method according to claim 38.

44. A method comprising:

demodulating and decoding content received within a number (M) of sequential pulses within a number (N) of narrower bands of a multiband ultra-wideband (UWB) signal, wherein the number of sequential pulses (M) within any given narrower band is greater than one (1).

45. A method according to claim 44, further comprising:

detecting narrowband interference (NBI) associated with one or more bands of the received MB-UWB signal; and

mitigating harmful effects of the detected NBI within the MB-UWB signal.

46. A method according to claim 45, wherein mitigating harmful effects of the NBI comprises instructing a transmitter of the MB-UWB signal to avoid use of a band on which the NBI was detected.

47. A method according to claim 44, further comprising:

analyzing a select band within the multiple bands of the MB-UWB spectrum to perform channel clearance activity; and

acquiring timing synchronization based, at least, on preamble information identified within a signal that exceeds a threshold within the select band.

48. A storage medium comprising content which, when executed by an accessing machine, causes the machine to implement a method according to claim 44.

49. A communication device comprising:

a memory having content available therein; and

control logic, coupled with the memory, to selectively access the memory and execute at least a subset of the content available therein to implement a method according to claim 44.